SHOCK RESPONSIVE MOMENTARY RELAY

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FIELD OF THE INVENTION

The present invention relates to unexpected earth movement sensitive devices,particularly earthquake activated electro-mechanical devices. In particular,the present invention relates to a device that can trip a circuit breaker in an earthquake,utilizing a common electrical relay type design.Briefly, the device comprises a mounting assembly,a horizontal relay bar providing multiple contactors,a weight connectably to the horizontal relay bar,held in centered position by a spring.Upon the occurence of an earthquake,this device will not remain in balance and the weight will uncontrollably cause the relay bar it is attached connectably to vibrate and move up and down and the relay bar will make momentary contact with the top contactors or the lower contactors.The present invention has two distinct modes of operation,and depending on the wiring method in use connectably to the relay,this device can either trip a circuit breaker in an earthquake,or engage as a momentary switch, a motor or the like.

SUMMARY OF THE INVENTION

The shock responsive momentary relay of the present invention provides a vibration or shock actuated electric relay which can be used in a variety of products.If the present invention

relay is wired to trip a circuit breaker,then all devices engaged to the particular circuit whereby the shock responsive momentary relay is connected to the circuit breaker,will be turned off by the present invention.The present invention relay,in another wiring mode,can turn on any electronic device in an earthquake.An example is a solenoid mounted attachably to a gas ,steam or water line. The momentary switching action of the present invention will activate the responsive mechanism to turn on the solenoid in the pipe to block the flow.As a momentary relay,the present invention can turn on or off lights, alarms,garage doors,etc., provided that the compatible electronics which react to momentary switching exist in these devices.In most instances they do or can be added at minimal expense.Additionally,the present invention does not need to be reset after an earthquake,which is the common problem in all responsive devices.The present invention returns to a perfect engineered balance after all earthquake activity stops.In use connectably to a circuit breaker,after the breaker trips,the breaker is the only device that needs to be reset.In use with momentary switching responsive devices,any device activated by the present invention can be turned off at the source location after the earthquake activity stops,as the present invention will not activate a new response until another earthquake has occurred.

The objects and advantages of the present invention are obtained by an engineered balance whereby the relay is held in a centered non continuity state between two sets of two contactors,one set of two above the relay and one set of two below the relay.The centering is achieved by a balance provided by a spring, and a weight attachably connected to the bottom of the relay. Each contactor is provided with adjustment means with a threaded hole through the contactor and a screw whereby the gap between the relay and the contactor can be reduced from a maximum of one quarter inch to any gap lesser than one quarter of one inch.

Upon the occurence of an earthquake,or other shock,the present invention cannot possibly remain in perfect balance, since perfect balance is designed in the relay to contactor spacing.Depending on the sensitivity adjustment which is adjustable,this device relay will vibrate and make momentary contact with either the top or the lower contactors.When contact is made,the present invention will cause a curcuit breaker to trip;if the present invention is electrically connected to a circuit breaker and wired as to create a short.This is accomplished by connecting one neutral terminal from the electrical panel box and connecting it to either the right side or left side of the contactor.In this instance,both top and lower contactors must be connected together at the side that the neutral wire is installed.Next,the hot lead coming out of the circuit breaker is left in place,but a second wire is installed in the breaker connectably to the same breaker and is attached to the opposite side of the present invention contactor,and the top and the lower contactors are connected together.

Since the relay is a solid metal bar,and not a two pole set of contacts,the result of the aforementioned wiring will create an electrical short thereby tripping the circuit breaker when an earthquake causes the present invention relay to vibrate and make momentary contact.In the instance of using the device to turn on power,the neutral wire is not used and a hot lead from any source can be installed on one side of the contactors,and the load wire connected to the opposite side.As long as the device used to be energized has compatible electronics to respond to a momentary switch,that device will be energized in event of an earthquake or other shock.

After the earthquake has subsided,the engineered balance returns to the designed centered balance which is equally spaced distance between the top and lower contactors and does not need to be reset. This device must be mechanically fastened to a building or its related parts to be accurate.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 shows a perspective view of the relay of the present invention.

FIG.2 shows an exploded view of the frame housing connection parts.

DETAILED DESCRIPTION OF THE INVENTION

Referring to **FIG.1**, the relay of the present invention has a **base portion 14**,which is an 'L' shaped metal one piece support for the entire relay.On the left side of this base is an extruded part from the same metal of **14**,which is **spring holder 13**.The stamped out recess to **13** is **18**.Therefore the spring which creates resistive tension to balance the relay starts at **13** and is connectably engaged to create resistance to **relay bar 9**.**Spring 12** is a spring that will lift up **relay bar 9** plus the **weight 16** and keep it centered between **contactors 1,2,3,4**.To adjust the relay for sensitivity,**screws 5,6,7,8** are turned clockwise to increase the response.The holes provided are threaded.These are **5a,6a,7a, 8a**. The **contactor housing 15** is secured to **base portion 14** by **screws 15a,15b**.**Screws 17** hold **weight 16** into position on **relay bar 9**.

Referring to **FIG.2**,the notched out top of **base portion 14** is seen,as well as the **restraining screws 10**,which prevent **relay bar 9** from moving forward.Also,the notched portion of **relay bar 9, notch 9a** is seen interfitting with the base portion.Since the relay bar is a solid metal piece,**grommets 11** are shown in this exploded view .The insulated grommets are necessary to prevent the spring from contacting electrical resistance for the possibility of electric arc from either de-calibrating the **spring 12** or destroying it from usage.